

FACULTY OF SCIENCE

M. Sc. III – Semester Examination, December 2018 / January 2019

Subject : Chemistry (Organic Chemistry)

Paper – I : Synthetic Reagents, Advanced NMR, Conformational Analysis & ORD

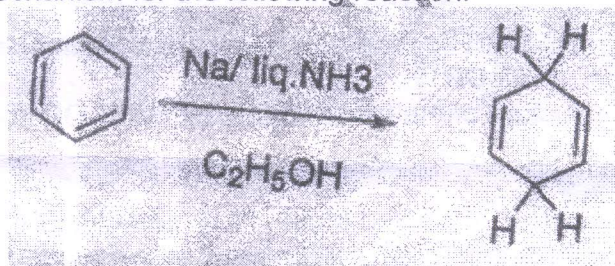
Time : 3 Hours

Max. Marks: 80

Note : Answer all questions from Part–A and Part–B. Each question carries 8 marks in Part–A and 12 marks in Part – B.

PART – A (4 x 8 = 32 Marks)
(Short Answer Type)

- Illustrate the methods for the protection of carbonyl group.
 - Explain the utility of organoboranes in carbon-carbon bond formation by taking two examples.
- Write the synthetic utility of DDQ.
 - Explain the mechanism for the following reaction.



- Write a brief note on DEPT spectra with suitable examples.
 - Describe the principles of 2D-NMR.
- Explain the terms circular birefringence and circular dichroism.
 - Write the conformational structures of N-Methylpiperidine and tropine.

PART – B (4 x 12 = 48 Marks)
(Essay Answer Type)

- Explain the synthetic applications of Gilman's reagent.
 - Discuss about the utility of trimethylsilylcyanides in organic synthesis.

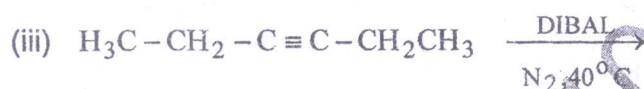
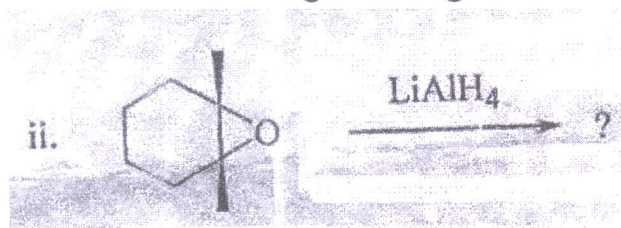
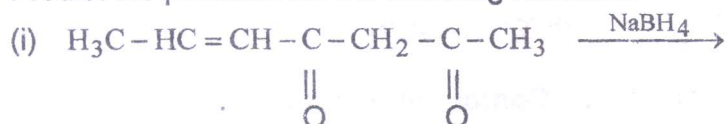
OR

 - Write the mechanism of Woodward oxidation.
 - Describe the synthetic applications of Petasis reagent.
- Explain the mechanism of Swern oxidation.
 - Give an account on the synthetic application of TEMPO.

OR

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(c) Predict the products for the following reactions



(d) Write the synthetic applications of Di-imide.

7 (a) How do you differentiate the structure (i) hexane (ii) 2-methyl pentane and (iii) 2, 2-dimethyl butane by ^{13}C -NMR spectra.

(b) Write a note on the types of ^{13}C -NMR spectra with appropriate examples.

OR

(c) How do you determine the structure of methyl salicylate by HETCOR spectrum?

(d) Define NOE and discuss its advantages with an example.

8 (a) Draw the conformational structures of cis and trans - 1, 2 dimethyl cyclohexanes and comment on the favoured conformation in each case by calculating their relative energies.

(b) Write note on the Axial halo ketone rule with appropriate examples.

OR

(c) Write a brief note on Cotton effect with suitable examples.

(d) The rate of acetolysis of trans 2-acetoxy cyclohexyl tosylate greater than the cis-acetoxy cyclohexyl tosylate. Explain.
